

CLAIMS

What is claimed is:

1. A data storage medium, comprising:
AV data; and
mark-up documents to reproduce the AV data in an interactive mode,
wherein among the mark-up documents, a start-up document comprises information about the mark-up documents to be displayed according to a set parental level.
2. The data storage medium of claim 1, wherein the information of the start-up document comprises meta-information of a parental level, where the set parental level and link information on one of the mark-up documents correspond to the parental level in the meta-information.
3. The data storage medium of claim 2, where the link information comprises information of one of the mark-up documents to be displayed when the set parental level is higher than the parental level in the meta-information and information of one of the mark-up documents to be displayed when the set parental level is less than the parental level in the meta-information.
4. The data storage medium of claim 1, wherein the information of the start-up document is link information indicating a path of one of the mark-up documents corresponding to the set parental level.
5. A data storage medium, comprising:
AV data; and
mark-up documents to reproduce the AV data in an interactive mode and corresponding to two different parental levels.
6. A data storage medium, comprising:
a video directory storing AV data; and
an interactive directory storing data to reproduce the AV data in an interactive mode,
wherein the interactive directory comprises sub-directories corresponding to two different parental levels, and in each of the sub-directories, mark-up documents corresponding to a parental level are stored.

7. A data storage medium, comprising:
 - a video directory storing AV data; and
 - an interactive directory storing a start-up document comprising a mark-up document to reproduce the AV data in an interactive mode,
 - wherein the interactive directory comprises sub-directories corresponding to two different parental levels, where in each of the sub-directories mark-up documents corresponding to a parental level are stored, and the start-up document comprises link information of the plurality of mark-up documents stored in each of the sub-directories.
8. The data storage medium of claim 7, wherein the link information is written using a link tag.
9. A data storage medium, comprising:
 - AV data;
 - a mark-up document to reproduce the AV data in an interactive mode; and
 - display rule information displaying the mark-up document to correspond to a set parental level.
10. The data storage medium of claim 9, wherein the display rule information comprises information indicating whether to display elements of the mark-up document corresponding to at least two different parental levels.
11. The data storage medium of claim 9, wherein the display rule information is written according to cascading style sheet (CSS) rules.
12. The data storage medium of claim 9, wherein a class value is allotted to one of the elements of the mark-up document, and the display rule information comprises information indicating whether to display an element to which the class value is allotted.
13. The data storage medium of claim 12, wherein the display rule information is written in the form of a CSS file.

14. The data storage medium of claim 1, wherein the AV data is DVD-video data, and the parental level meets DVD-video standards.

15. A data storage medium, comprising:

AV data; and

a mark-up document to reproduce the AV data in an interactive mode and comprising a manner in which another mark-up document written in a Script language is provided to meet a parental level that is set in advance.

16. The data storage medium of claim 15, wherein the mark-up document is linked to a script file written in a script language or a CSS file.

17. A method to reproduce AV data in an interactive mode, comprising:

identifying a set parental level; and

reproducing the AV data in the interactive mode using a mark-up document corresponding to the identified parental level.

18. The method of claim 17, wherein comprises:

identifying the parental level in meta-information written in a mark-up document designated as a start-up document; and

reproducing the AV data using the mark-up document selected based upon a result of comparing the parental level identified in the meta-information with the parental level identified in as the set parental level.

19. The method of claim 17, wherein the AV data is reproduced in the interactive mode using the mark-up document presenting a warning message indicating that interactive content cannot be displayed when the parental level in the meta-information is lower than the set parental level.

20. A method to reproduce AV data in an interactive mode, comprising:

identifying a set parental level;

reading a mark-up document in a sub-directory corresponding to the set parental level among sub-directories of an interactive directory; and

reproducing the AV data in an interactive mode using the read mark-up document.

21. A method to display a mark-up document according to a parental level, comprising:

- identifying a predetermined value of an element of a mark-up document; and
- determining whether to display the predetermined value of the element depending on the predetermined value based on display rule information.

22. A method to reproduce AV data in an interactive mode using a mark-up document, comprising:

- identifying a class value of an element of a mark-up document;
- determining whether to display the element depending on the class value and display rule information; and
- embedding an AV screen obtained by reproducing the AV data in a mark-up screen obtained as a result of the determination and displaying the result of the embedment.

23. The method of claim 21, wherein the display rule information is written according to CSS rules.

24. The method of claim 23, wherein the display rule information is written in the form of a CSS file.

25. An apparatus to reproduce AV data of a data storage medium in an interactive mode using a mark-up document, comprising:

- a reader reading the mark-up document and AV data from the data storage medium;
- an AV decoder decoding the AV data;
- a presentation engine identifying a predetermined value of an element of the mark-up document and determining whether to display the element depending on the predetermined value and to display rule information; and
- a blender blending a mark-up document interpreted by the presentation engine and an AV screen obtained by reproducing the AV data.

26. The apparatus of claim 25, wherein the display rule information is written according to CSS rules.

27. The apparatus of claim 26, wherein the display rule information is written in a form of a CSS file.

28. A reproduction system, comprising:
a data storage medium;
an apparatus to reproduce AV data recorded on the data storage medium in an interactive mode using a mark-up document corresponding to the AV data; and
a display device to display a mark-up screen obtained using the mark-up document with an AV screen obtained by reproducing the AV data, wherein the AV screen is embedded in the mark-up screen.

29. The reproduction system of claim 28, wherein the interactive mode is a display mode in which the AV data is reproduced, displayed in a display window defined by the mark-up document.

30. The reproduction system of claim 28, wherein the AV screen is a screen displayed on the display device when reproducing the AV data, and the mark-up screen is a screen displayed on the display unit when interpreting the mark-up document.

31. The reproduction system of claim 28, wherein the apparatus to reproduce the AV data comprises:

a parental level setting button or an on-screen display menu to enable the user to set a parental level

32. The reproduction system of claim 28, wherein the apparatus to reproduce the AV data receives data from and transmits the data through a network.

33. The reproduction system of claim 28, wherein the mark-up document comprises an application program to reproduce the AV data in the interactive mode and contains interactive contents to be displayed on the display device together with the AV data.

34. An apparatus to reproduce data from a data storage medium, comprising:
a reader reading the data from the data storage medium; and

a controller outputting a control signal to the reader to read AV data and a mark-up document from the data storage medium, wherein, in an interactive mode, the controller interprets the mark-up document corresponding to a parental level set by a user indicative of whether to reproduce the AV data recorded on the data storage medium.

35. The apparatus of claim 34, further comprising:

an AV decoder decoding the AV data; and

a blender blending the mark-up document and an AV screen obtained by reproducing the AV data.

36. The apparatus of claim 34, further comprising:

a display window; and

a blender blending the AV data with the mark-up document so that the AV data is displayed in the display window defined by the mark-up document and an AV screen is embedded in the mark-up document screen.

37. The apparatus of claim 34, wherein the presentation engine comprises plug-in.

38. The apparatus of claim 34, wherein the controller retrieves data and the mark-up document through a network.

39. The apparatus of claim 34, wherein the parental level has five different parental levels comprising G, PG, PG13, R, and NC-17 defined by data storage medium-video standards for compatibility.

40. The apparatus of claim 34, wherein the mark-up documents reproduce the AV data recorded on the data storage medium according to data storage medium-video standards in the interactive mode, and the mark-up documents are provided according to parental levels for compatibility.

41. The apparatus of claim 34, wherein the presentation engine uses an application program interface (API) to identify the parental level set for the apparatus.

42. The apparatus of claim 34, wherein the parental level information is a parental level written in a start-up document, where the start-up document comprises meta-information on the parental level, a set parental level, and link information of the mark-up document corresponding to the parental level in the meta-information.
43. The apparatus of claim 42, wherein the link information is the mark-up document information indicating whether the parental level set by the user is higher or lower than the parental level written in the start-up document.
44. The apparatus of claim 34, wherein the controller identifies the parental level set in the apparatus to reproduce the data using an application program interface (API) and interprets the mark-up document using meta-information and link information written in a mark-up document designated as a start-up document.
45. The apparatus of claim 34, wherein the data storage medium comprises a root directory having a video directory where the AV data is stored and an interactive directory where the mark-up document to support the interactive mode.
46. The apparatus of claim 34, wherein the link information comprises mark-up document information indicating the parental level set by the user for the apparatus to reproduce the data.
47. The apparatus of claim 34, wherein the mark-up document comprises the CSS file.
48. The apparatus of claim 48, wherein the CSS file is generated separately from the mark-up document.
49. The apparatus of claim 34, wherein the mark-up document is written using a script language to represent a document appropriate for the parental level.
50. A method to reproduce AV data in an interactive mode, comprising:
selecting the interactive mode;
identifying a parental level set by a user;

identifying the parental level written in a mark-up document designated as a start-up document;

comparing the parental level recorded in the mark-up document with the parental level set by the user;

reproducing the AV data in the interactive mode using the mark-up document with a warning message indicating that the interactive content corresponding to the AV data cannot be displayed when the parental level written in the start-up document is less than the parental level set by the user; and

reproducing the AV data in the interactive mode using the mark-up document comprising the interactive content to the AV data when the parental level written in the start-up document is higher than the parental level set by the user.

51. A method to display a mark-up document, comprising:

identifying a parental level set by a user;

identifying a class value allotted to a predetermined element of the mark-up document;

determining whether to display the predetermined element based upon the parental level identified and the class value allotted to the predetermined element; and

displaying the predetermined element.

52. A method to reproduce AV data in an interactive mode using a mark-up document, comprising:

identifying a parental level set by a user;

identifying a class value assigned to a predetermined element of the mark-up document;

determining whether to display the predetermined element based upon the parental level identified and the class value and with reference to display rule information; and

embedding and displaying an AV screen obtained by reproducing the AV data in the mark-up screen.